

AKRIDIN, Dmitriy Vladimirovich, starshiy prepodavatel'; GALKANOVA, Nina Dmitriyevna, assistant; GVOZDOVSKIY, Viktor Il'ich, assistant; GLUKHOVSKOV, Aleksandr Petrovich, inzh.; SAMOYLOV, Boris Nikolayevich, dotsent, kand. tekhn. nauk; YAKUBOVSKIY, Boris Vasil'yevich, prof. Prinimali uchastiye: POLONSKIY, A.V., assistant; LEONT'YEV, G.V., assistant; BITYUTSKIY, A.I., assistant; DAVYDOV, S.S., doktor tekhn. nauk, prof., red.; MIKHAYLOV, K.V., kand. tekhn. nauk, nauchnyy red.; BUDARINA, E.M., red. izd-va; GARNUKHIN, Ye. K., tekhn. red.

[Prestressed concrete abroad; materials] P redvaritel'no napriazhennyi zhelezobeton za rubezhom; materialy. Pod red. S.S.Davydova i B.V. Iakubovskogo. Moskva, Gos. izd-vo lit-ry po stroit., arkhitekt. i stroit. materialam, 1961. 343 p. (MIRA 14:10)

1. International Congress of Prestressed Concrete. 3rd, Berlin, 1958.
 2. Deystvitel'nyy chlen Akademii stroitel'stva i arkhitektury SSSR (for Davydov).
 3. Kafedra zhelezobetonnykh i kamennykh konstruksiy Kuybyshevskogo inzhenerno-stroitel'nogo instituta i chleny Kuybyshevskogo filiala Komissii po sbornomu i predvaritel'no napryazhennomu zhelezobetonu Akademii stroitel'stva i arkhitektury SSSR (for Akridin, Galkanova, Gvozдовskiy, Glukhovskov, Samoylov, Yakubovskiy)
- (Prestressed concrete)

AKRIDIN, Dmitriy Vladimirovich, starshiy prepodavatel'; GALKANOVA, Nina Dmitriyevna, assistant; GVOZDOVSKIY, Viktor Il'ich, assistant; GLUKHOVSKOV, Aleksandr Petrovich, inzh.; SAMOYLOV, Boris Nikolayevich, dotsent, kand.tekhn.nauk; YAKUBOVSKIY, Boris Vasil'yevich, prof. Primali uchastiye: POLONSKIY, A.V., assistant; LEONT'YEV, G.V., assistant; BITYUTSKIY, A.I., assistant; DAVYDOV, S.S., doktor tekhn.nauk, prof., red.; MIKHAYLOV, K.V., kand.tekhn.nauk, nauchnyy red.; BUDARINA, E.M., red. izd-va; GARNUKHIN, Ye.K., tekhn. red.

[Prestressed concrete abroad; materials] P redvarietel'no napriazhennyi zhelezobeton za rubezhom; materialy. Pod red. S.S. Davydova i B.V. Yakubovskogo. Moskva, Gos. izd-vo lit-ry po stroit., arkhitekt. i stroit. materialam, 1961. 343 p. (MIRA 14:10)

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(Prestressed concrete)

GALKANOVA, N.D., inzh.; KRAMAR', V.G., inzh.

Prestressed 3x12m slabs with strand reinforcement for roofs of industrial buildings. Bet.1 zhel.-bet. 9 no.12:532-537 D '63. (MIRA 17:2)

L 39872-66 OD-2

ACC NR: AP6018145

SOURCE CODE: UR/0020/65/162/005/1198/1200

AUTHOR: Sushko, N. G.; Meyerson, Ye. M.; Galkel', V. R. ¹⁰B

ORG: Institute of Experimental Biology, AMN SSSR (Institut eksperimental'noy biologii AMN SSSR); Central Institute of Traumatology and Orthopedics, Ministry of Health SSSR (Tsentral'nyy institut travmatologii i ortopedii Ministerstva zdravookhraneniya SSSR); Institute of Physical Problems AN SSSR (Institut fizicheskikh problem AN SSSR)

TITLE: Influence of deep freezing on the grafting and antigenic activity of skin homotransplants 22

SOURCE: AN SSSR. Doklady, v. 162, no. 5, 1965, 1198-1200

TOPIC TAGS: rabbit, skin physiology, blood circulation

ABSTRACT: The viability of rabbit skin, exposed for one day to a medium containing 15% glycerin or 10% dimethyl sulfoxide, then frozen in dry ice, liquid nitrogen, or liquid helium, was determined according to its survival after autotransplantation. The state of the homotransplants of frozen skin was determined according to the periods of restoration and the disturbance of blood circulation in them. The autotransplants treated by various methods proved viable and in most cases gave true and permanent grafts. However, homotransplants, subjected to freezing, as a rule, died on the ninth to 13th day. Repeated homotransplants from the

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L 39872-66

ACC NR: AP6018145

same donors died more rapidly than primary transplants, indicating pronounced sensitization of the organism of the recipient under the influence of the primary frozen transplant. An investigation of the reaction of the regional lymph nodes indicated that the antigenic activity of skin homotransplants subjected to deep freezing is retained, while the duration of survival of such transplants virtually does not differ from that in homotransplantation of fresh skin. The authors conclude that an attempt to overcome immunological incompatibility in homoplastic skin transplants by the influence of low temperature is unjustified. This paper was presented by Academician V. A. Engel'gardt on 17 March 1965. Orig. art. has: 2 tables. [JPRS]

SUB CODE: 06 / SUBM DATE: 16Mar65 / ORIG REF: 005 / OTH REF: 005

Card 2/2

USSR/Medicine - Infectious Diseases

Feb 53

"The Hemagglutination Reaction in Scarlet Fever,"
Yu. P. Tutyshtina, Z. N. Galker, Chair of Epidemiol,
Kiev Order of Labor Red Banner Med Inst iment
Acad A. A. Bogomolets

"Zhur Mikrobiol, Epidemiol, i Immunobiol" No 2,
pp 25, 26

A specific antigen from the throat washings of
scarlet fever patients may be adsorbed on human I
(O) erythrocytes. This antigen can then be de-
tected by the hemagglutination reaction with sera
of patients recovered from scarlet fever (A) and

24676

antiscarlet fever streptococci sera (B). A posi-
tive hemagglutination reaction is most often ob-
served in the early days of the disease. When
the temp of the patients is normal, a positive
reaction with B is more frequent. In view of the
fact that the results of the reactions with A and
B are not always identical, one must assume in-
homogeneity of the antigen.

24676

KOLYASEV, F.Ye.; GAL'KEVICH, G.Ya.

Means for improving heavy Podzolic soils. Sbor. trud.po agron.fiz.
no.6:162-169 '53. (MIRA 11:7
(Podzol)

USSR / Soil Science. ~~Organic~~ Fertilizers.

J

Abs Jour: Ref Zhur-Biol., No 21, 1958, 95768.

Author : Gal'kevich, G. Ya.

Inst : ~~Northern Scientific-Research~~ Institute of Water
Engineering Melioration.

Title : Influence of Sapropel on Water, Physical and
Chemical Properties of Soil

Orig Pub: Tr. Severn. n.-1. in-ta gidrotekhn. i melior.,
1957, vyp. 13, 105-115.

Abstract: Sapropel (S) was studied in field experiments in
kolkhozes of Rostov Rayon, Yaroslavskaya Oblast
on clayey and sandy soils, with its application
by sowing along the surface of the plowland (under
potatoes and onions), in holes (under potatoes)
and by means of pouring it out of a pipeline
(under grasses). S. contains: 15.9-29.41% of

Card 1/2

GAL'KEVICH, I.D., veterinarnyy vrach

Subcutaneous administration of heterogenic blood to animals
following acute bloodletting. Trudy NIVI 1:240-244 '60.

(MIRA 15:10)

(Blood as food or medicine)(Veterinary medicine)

ORANSKIY, N., inzh.; GAL'KEVICH, L., inzh.

Tractors on livestock farms. Nauka i pered. op v sel'khoz. 9
no.6:57-59 Je '59. (MIRA 12:9)
(Tractors)

FAYTEL'BERG, R.O.; OCHAN, S.I.; GAL'KHOVAYA, Ye.I. [Hol'khova, IE.I.]

Absorption of glucose and chlorides in the small intestine of sheep following administration of bromine and caffeine. Fiziol. zhur. [Ukr.] 6 no. 5:612-621 S-0 '60. (MIRA 13:10)

1. Kafedra fiziologii Odesskogo sel'skokhozyaystvennogo instituta. (ABSORPTION (PHYSIOLOGY)) (BROMINE) (CAFFEINE)

GALKIEWICZ, Tadeusz

DECEASED

1963/2

c' 1961

GEOLOGY -
metals

see ILC

GALKIEWICZ, T.

POL.

Galkiewicz T. Geological Principles of Planning the Exploitation of Hard Minerals.

"Geologiczne podstawy planowania eksploatacji kopalin twardych". Przegląd Górniczy, No. 6, 1963, pp. 213-219, 3 figs. 2 tabs.

The planning of winning should be based on industrial classification of resources: accessible resources and such as have been prepared and are ready for working. Definition of these conceptions. Method of keeping records of industrial resources -- one based on winning, and the other on control carried out by means of measuring instruments. Forms of losses in resources. Method of compiling a balance sheet of industrial resources and mobility of resources, according to industrial categories. Fixing standards for the volume of resources available for intended production, together with standards for the margin of losses. These geological planning principles assure continuity in, and development of, exploitation.

GALKIEWICZ, T.

2078. Galkiewicz, T., Application of the perturbation method for the determination of the critical force of a compressed bar with a variable cross section (in Polish), *Zest. Nauk* 11, 10, *Mechanika*, no. 4, 99-111, 1956.

Author applies the perturbation method to the problem of stability of a bar with discontinuously variable cross section $I(x) = I_0 [1 + \beta \phi(x)]$. The discontinuous function $\phi(x)$ is approximated by means of a few terms of a trigonometrical series, and three terms of the expansion of the critical force in a power series in β are taken into account. Calculations are carried out in three concrete cases. M. Sokolowski, Poland

(7) PLK/FU 4 5, 7.

Poland/Cosmochemistry. Geochemistry. Hydrochemistry.

D

Abs Jour : Ref Zhur-Khimiya, No 2, 1958, 4183.

Author : Galkiewicz T.

Inst : Not given.

Title : Genesis of Silesian-Cracow Zink-Lead Deposits
In K. Keil's Interpretation.

Orig Pub : Przegl. Geol. 1957, 5, No 7, 314-319.

Abstract : No abstract.

Card 1/1

GALKIEWICZ, T.

TECHNOLOGY

PERIODICAL: PREZGLAD GEOGICZNY, Vol. 6; no. 2, Feb. 1958.

GALKIEWICZ, T. The determination of the average metal content in metallic ores. p. 81.

Monthly List of East European Accessions (EEAI) LC Vol. 8, no. 4
April 1959, Unclass.

GALKIEWICZ, Tadeusz, mgr., inz.

Isotopic composition lead originating from the Silesia-Cracow zinc
and lead ore deposits. Rudy i metale 6 no.6:267-268 Je '61.

BIALACZEWSKI, Antoni; GALKIEWICZ, Tadeusz

The pyrite - copper Buenavista deposits in Cuba. Przegl geol 11 no.7:
383-387 J1 '61.

1. Ministerstwo Przemyslu Cieskiego.

GALKIEWICZ, Tadeusz, mgr., inz. [REDACTED]

Bases of geological map accuracy. Rudy i metale 6 no.12:544 D '61.

1. Redaktor naukowy miesiecznika "Rudy i metale niezelazne."

GALKIEWICZ, Tadeusz, mgr inz.

Outline of the geology of Cuba. Rudy i metale 6 no.8:362-364
Ag '61.

1963

GALKIEWICZ, T.

An international geological congress in Poland? Przegl
geol 10 no.11:618-619 N '62.

GALKIEWICZ, Tadeusz, mgr., inz.

The method for prospecting for solid mineral deposits. Rudy i
metale 7 no.1:20-22/62.

GALKIEWICZ, Tadeusz, mgr., inz.

Indications for prospecting mineral raw material deposits.
Rudy i metale 7 no.2:54-59 '62.

1. Redaktor naukowy miesiecznika "Rudy i Metale niezelazne"

GALKIEWICZ, Tadeusz, mgr., inż.

Premises for the appearance of mineral deposits. Rudy i metale
7 no.3:138-145 '62.

1. Redaktor naukowy miesiecznika "Rudy i metale niezelazne"

GALKIEWICZ, Tadeusz

Remarks on Rumania's metallogeny. Przegl geol 10 no. 4/5:236-237.
Ap-May '62.

152
GALKIEWICZ, Tadeusz, mgr.inz.

On the method of exploring deposits of solid minerals. Rudy i
metale 7 no.9:408-414 S '62.

GALKIEWICZ, Tadeusz

Polish geological terminology. Przegl geolog 10 no.7:378
Jl '62.

GALKIEWICZ, Tadeusz

Cyprus, geology and mineral resources. Przegl geol 10 no.10:548-552
0 '62.

GALKIEWICZ, Tadeusz

Asbestos deposits in Cyprus. Przegl geol 10 no.8:432-434 Ag '62.

GALKIEWICZ, Tadeusz, mgr inz.

Characteristics of Yugoslavia's metallogeny. Rudy i metale 7
no.12:555-557 D '62.

ACCESSION NR: AT4017646

P/2534/63 /000/010/0021/0032

AUTHOR: Gałkiewicz, Tadeusz

TITLE: Stability of long orthotropic rib-reinforced long cylindrical shell

SOURCE: Łódz. Politechnika. Zeszyty naukowe, no. 51, 1963. Mechanika (Mechanics), no. 10, 21-32

TOPIC TAGS: shell, cylindrical shell, orthotropic shell, orthotropic cylindrical shell, rib reinforced shell, rib reinforced long shell, rib reinforced cylindrical shell, shell stability, shell endurance, shell stress, shell torsion, long twisted shell stability

ABSTRACT: The purpose of the work is to find approximate and relatively simple final equations for the stress and torsion moment for twisted long orthotropic rib-reinforced shells. This problem was solved by Z. Parszewski (Zeszyty naukowe Politechniki Łódzkiej, Mechanika, no. 2, 1954) using the differential equations of volume balance. The present solution is based on the energy method, using the equations of the theory of shells of low curvature, which are

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ACCESSION NR: AT4017646

solved by the Ritz method. The resultant formulas show the effects of the material properties on the solutions and at the same time permit an analysis of the reinforcing action of the ribs on the shells. The calculated data for the orthotropic shells were compared with those for isotropic shells. Orig. art. has: 1 figure and 39 formulas.

ASSOCIATION: Łódź, Politechnika, Katedra Wytrzymałości Materiałów (Łodz, Polytechnic Institute, Department of Strength of Materials).

SUBMITTED: 00

DATE ACQ: 24Mar64

ENCL: 00

SUB CODE: MM, MD

NO REF SOV: 000

OTHER: 004

Card 2/2

GALKIEWICZ, Tadeusz, mgr inz.

Evaluation of the size and quality of ore deposits. Rndy 1 metale 8
no.3:101-102 Mr '63.

GALKIEWICZ, Tadeusz, mgr inz.

"Metals" by J. Loth, Z. Petrazycka. Reviewed by Tadeusz Galkiewicz.
Rudy i metale 8 no. 4:140-141 '63.

GALKIEWICZ, Tadeusz, mgr. inz.

Geocosmology. Rudy i metale 8 no.9:324-327 S'63.

GALKIEWICZ, Tadeusz, mgr inż.

World resources of lead and zinc. Rudy i metale 8 no.12:
474-478 D'63.

GALKIEWICZ, Tadeusz, mgr inz.

Metallogenesis in Turkey and its characteristics. Rudy i metale 9
no.2:89-92 F 64.

GALKIEWICZ, Tadeusz, mgr inż

Poland's raw material base of nonferrous metals. Rudy i metale
9 no.7:339-343 J1 '64.

1. Chief Geologist, Association of Nonferrous Mining and Metallurgy,
Katowice.

GALAIEWICZ, Tadeusz, dr. inz.

Problem of nonlinear stability of orthotropic cylinder shell
subject to torsion. Przegl mech 23 no.24:722 25 D '64.

1. Department of Material Strength, Technical University, Lodz.

GALKIN, A.

In the Chernozemskiy Machinery Station for Livestock farms, MTS 12, No 8,
1952.

KOPITAYKO, S., inzh.; TSIKMAN, N., inzh.; GALKIN, A., inzh.

Assembling prefabricated wooden trusses. Stroitel' no. 3:19 Nr '58.
(Trusses) (MIRA 11:2)

GALKIN, A.

Small-sized hot-water heating. Pozh.delo 4 no.11:9-10 N '58.
(MIRA 11:12)

1. Starshiy inspektor Upravleniya pozharnoy okhrany Permskogo
oblispolkoma.

(Hot-water heating)

GALKIN, A.

Selling building materials and supplies in villages. Sel'.
stoi. 9 no.1:6-7 Ja-F '59. (MIRA 13:2)

1. Chlen pravleniya TSentrosoyuza.
(Building materials)

POPOVICH, G., general-mayor voysk svyazi; GALKIN, A., podpolkovnik

Refresher training periods are an important method in
instructing communications specialists. Voen. vest. 40
no. 3:98-99 Mr '61. (MIRA 14:2)
(Communications, Military--Study and teaching)

L 60299-65 EPF(c)/EPF(n)-2/EWG(c)/EEC(k)-2/EWA(h)/EWT(d)/EWT(i)/EWT(m)/T/
EWP(b)/EWP(t) Pr-4/Pu-4/Peb IJP(c) WW/JD
ACCESSION NR: AT5009445

Z/0000/54/000/000/0102/0104

AUTHOR: Bratashevski, Yu. A.; Galkin, A. A.; Ivanchenko, Yu. M.

TITLE: Combined resonance in InSb

SOURCE: Conference on Low Temperature Physics and Techniques. 3d, Prague, 1963.
Physics and techniques of low temperatures; proceedings of the conference. Prague,
Publ. House of the Czechosl. Academy of Sciences, 1964, 102-104

TOPIC TAGS: indium²⁷ antimonide, combined resonance, low temperature research, spin
orbit interaction, anisotropy, cyclotron resonance

ABSTRACT: The authors studied combined resonance in an n-type InSb sample with a carrier density $8 \times 10^{13} \text{ cm}^{-3}$ and mobility of about $3 \times 10^{15} \text{ cm}^2/\text{V-sec}$ at liquid-oxygen temperature. The sample was in the form of a lens 0.405 mm in diameter and 0.2 mm high, and was placed in the antinode of the electric field of a superheterodyne radiospectroscope operating at $7.5 \times 10^{10} \text{ cps}$. An intense cyclotron resonance line, displaced by the plasma effect into the region of higher magnetic field, was observed at transverse polarization. The calculated value of the carrier density was $1.1 \times 10^{14} \text{ cm}^{-3}$, which was in good agreement with values obtained for the sample. The cyclotron resonance line could be appreciably cancelled by producing longitudinal polarization, making it possible to observe four additional absorption lines. The lines disappeared when the sample was placed in the antinode of the

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ACCESSION NR: A15009445

high-frequency resonator magnetic field, showing their excitation to be electrical in nature. Analysis showed the spin line to be isotropic within the limits of experimental error, in spite of the fact that the theory of combined resonance calls for some anisotropy. This may be caused by scattering from impurities at hydrogen temperatures. The anisotropy was rechecked at liquid-nitrogen temperature, using a spherical sample 0.3 mm in diameter with carrier density $2 \times 10^{14} \text{ cm}^{-3}$. In this case it was impossible to compensate for the cyclotron resonance by obtaining longitudinal polarization, so that the observation of the anisotropy was confined to a part of the spectrum which included the most intense combined-resonance lines. The results showed that the derivatives of the absorption curve constitute superpositions of wide and nearly-ordered overlapping bands, and their anisotropy apparently plays an important role. Orig. art. has: 4 figures.

ASSOCIATION: Fiziko-tehnicheskiy institut nizkikh temperatur, Khar'kov (Physico-technical Institute of Low Temperatures)

SUBMITTED: 00

ENCL: 00

SUB CODE: SS, NP

NR REF SOV: 004

OTHER: 005

Card 2/2

GALVIN, A. B.

M

PROCESSES AND PROPERTIES INDEX
 *Investigations of Superconductivity at High Frequencies [Thallium]. B. G. Lazarev, A. A. Galvin, and W. I. Khotkevich (*J. Physics (U.S.S.R.)*, 1961, 4, (4), 380). [In English]. Brief abstract of a paper presented at a Conference on Low-Temperature Physics, Moscow, 1961. The investigations were carried out on thallium. Owing to its low critical field, measurements can be made at 2° K., i.e. in a cryostat filled with helium II. H.F. currents were passed through a superconducting wire (max. frequency 2×10^5 kc./s.), the amplitude of which could be brought to a value greater than the critical current. At the same time a continuous current, small compared to the amplitude of the A.C., was passed through the wire. By means of a continuous current galvanometer, measurements were made of the p.d. at the ends of the superconductor as depending on the strength of the A.C. When the continuous current was imposed on the sinusoid of the alternating one, the remelting current became asymmetric; on increasing the A.C. it became greater than the critical value in the first half period and it was lower than the critical value in the second half period. By further increasing the A.C., it became greater than the critical value in the second half period also. Therefore, at first the continuous-current galvanometer gives no deflection, and there then follows a quick increase in the p.d. which, after reaching a maximum, falls to the value defined by the

strength of the continuous current and the residual resistance. If the time τ for establishing (or destroying) superconductivity is less than the half period of the current, then for all small values of the continuous current there will be observed a maximum in the dependence of the const. p.d. on the specimen of the strength of the A.C. If τ is near to the half period, this maximum will not be found for very small currents. The measurements showed that $\tau \approx 10^{-8}$ sec.

537.312.63 3448

Variation of superconductivity of the under normal conditions. LARSEN, R. G., AND JAKIN, A. A. *C.R. Acad. Sci. USSR*, 37, 3, pp. 91-92, 1942.—It has been observed that with thin tin films freshly prepared by condensation on glass cooled with liquid He, abnormally high values are obtained for the critical temperatures (T_c) of superconductivity and magnetic field (H_c), whilst the critical currents (I_c) are abnormally low. The note describes preliminary investigations on the superconductivity of Sn, which show that abnormally high values of T_c , H_c and dH_c/dT , and low values of I_c , may also be observed in thick metal (alloy), when certain conditions of tensile strain are provided. In both cases the anomalies are attributed to the existence of strong local tensile strains in the crystal lattice. A. S. T.

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ASB-5LA METALLURGICAL LITERATURE CLASSIFICATION

TEST AND 2ND CRITERIA																										PROCESSES AND PROPERTIES INDEX																										1ST AND 2ND CRITERIA																									
<p><i>M</i></p> <p>*On the Variation of Superconductivity of Tin Under the Influence of Inhomogeneous Strain. B. Lazarev and A. Galkin (<i>Zhur. Eksp. Teor. Fiziki</i>, 1944, 14, (12), 474-480 (in Russian); and <i>J. Physics (U.S.S.R.)</i>, 1944, 8, (6), 371-376 (in English)).—The superconducting properties of tin wires subjected to mixed extensive and compressive forces were investigated. The inhomogeneous strains were produced by cementing the wire under examination on to a glass plate and immersing the whole assembly in liquid helium. Abnormal properties, similar to those shown by thin films prepared by condensation on a cold surface, were observed. Values of the critical temp. and critical field were appreciably higher than for strain-free specimens. The results are fully discussed, and it is concluded that the anomalies in both thin films and strained wires are due to distortions of the crystal lattice.—G. R.</p>																																																																													
<p>ASD-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																																																																													

GALKIN, A. A.

537.312.62-96

125

Some experiments on superconductivity at radio frequencies. LASHREV, B. G., GALKIN, A. A., AND KROJNEVICH, V. I. *C.R. Acad. Sci. USSR*, 55 (No. 9) 805-7 (1947).—Alternating currents of either 50 or 2.3×10^4 to 2×10^5 c/s were superimposed on a direct current in wires of superconducting Hg. A d.c. voltage was observed which went through a max. if the a.c. was increased at const. d.c. At 50 c/s the results can be understood by assuming instantaneous destruction and re-establishment of superconductivity when the critical field is passed. At r.f. the max. becomes more and more flattened as the frequency increases. This behaviour is thought to be due to relaxation phenomena with a time constant of $\sim 10^{-11}$ sec. H. L.

GALKIN, G.A.

2

Oscillography of the curve of perturbation of superconductivity by currents of acoustic frequencies. A. A. Gal-kin and R. G. Lazarev. *Zhur. Eksp. i Teor. Fiz.* (J. Exptl. Theoret. Phys.) 10, 833-8(1948). -- An upper limit for the time τ required for the transition from the normal to the superconductive state was obtained, for Sn, by oscillograms of the voltage V at frequencies up to 20,000 hertz. At 3.74°K., i.e. somewhat above the transition temp., the oscillogram is very nearly sinusoidal. Below the transition temp., at 3.4°K., the sample is superconducting during the time intervals when the current intensity is below crit., and is normal when the current is above crit. In this case, the oscillograms show horizontal portions corresponding to $V = 0$. At const. current intensity, the width of the horizontal portions increases with decreasing temp. Transition from one state to another is accompanied by a steep jump of V . From its steepness, at 20,000 hertz, it can be concluded with certainty that $\tau < 2 \times 10^{-9}$ sec. Further, the min. velocity of spreading of the boundary between the normal and the superconducting phase can be estd. to 10^7 cm./sec. N. Thon

ASB 56 A METALLURGICAL LITERATURE CLASSIFICATION

GALKIN, N. A.

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537.312.62 : 538.36.029.6
1459. Superconductivity at a frequency of 1.8×10^{10} c/s. GALKIN, A. A. AND LAZAREV, B. G. Letter in *J. Exp. Theor. Phys., USSR*, 18 (No. 12) 1145-6 (1948) In Russian. -- Measurements were made with a short-wave magnetron and closed waveguide at liquid He temperature. The waveguide had a reflecting Sn wire grid a few cm from its closed end and the detector was placed in the voltage anti-node in the uncooled part of the waveguide. At temperatures $< T_{crit}$ the application of a longitudinal (i.e. || Sn-wire) magnetic field of super-critical strength leads to an $\sim 5\%$ lowering of the detector voltage. Above T_{crit} or below H_{crit} the magnetic field has no influence. The strength of the magnetic field and the occurrence of the effect coincide with the critical fields for Sn. For a transverse field the effect is delayed owing to an intermediate state being produced. The applied frequency of 1.8×10^{10} c/s is thus found not to be the critical one for Sn which at this frequency exhibited a difference in its reflecting properties, corresponding to the conversion from the superconducting into the normal state initiated by the magnetic field. U. S. S. R.

ASU-3.1.1 METALLURGICAL LITERATURE CLASSIFICATION

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GALKIN, A.N.
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*On the Detecting Properties of Superconductors [Tin-Bismuth Alloy]. A. A. Galkin and B. G. Lazarev (*Doklady Akad. Nauk S.S.S.R.*, 1948, **20**, (4), 607 (1948)). [In Russian]. Rectifying properties of superconductors have been investigated by studying variations in the magnitude of demodulated signal with temp., radio-frequency current, and D.C. bias in 0.05-mm.-dia., 80-mm.-long specimens of Sn-Bi eutectic alloy with $R/R_0 = 0.1$ and $T_c = 3.815^\circ\text{K}$. The demodulated voltage showed a max. at temp. at which $R/R_0 = 2$, where R_0 is the resistance of the specimen in the normal state. The modulation of modulated radio-frequency current is explained by the non-linearity in the voltage-current relationship in the transition region between the superconducting and normal state. Demodulation did not occur in the absence of bias current, and no hysteresis was observed in the resistance-current relationship. This last phenomenon produces "frozen" fields which account for detecting effects in the absence of bias current reported for NbN by Andrews, Milton, and de Sorbo (*J. Opt. Soc. Amer.*, 1949, **39**, 518). B ref. A. G.

USSR/Physics
Superconductivity

Tin

"Several Features of Superconductive Transition,"
A. A. Galkin, B. G. Lazarev, Physioobtech Inst, Acad
Sci USSR, 2 pp

613.633
613.571
(5)

"Dok Ak Nauk SSSR" Vol IXI, No 6

Conducted detailed research on the curve describing

superconductive transition in tin and phenomena.

Immediately following the superconductive state.

Resistance of the sample reappears in very narrow

interval (2 · 10⁻⁴ O), and with further increase of

35/49183

Aug 48

USSR/Physics (Contd.)

decrease in temperature, it disappears and the super

conductive state is restored. Submitted by Acad
S. I. Vavilov, 18 Jun 48.

35/49183

Aug 48

GALKIN, A. A.

Chernov, N. A. Galkin, H. N.
1951

Some particularities of the transition into the superconducting state. I. A. A. Galkin, Ya. S. Kau, and B. G. Lazarev (Phys.-Tech. Inst., Acad. Sci. Ukr. S.S.R., Kiev). *Zhur. Eksp. Teor. Fiz.* 20, 865-70 (1950); cf. C.A. 43, 457g. On continuous lowering of the temp. at the uniform rate of $0.0005^\circ/\text{min}$. in the vicinity of 3.7°K , a 0.03-mm -diam., nearly-single-crystal wire of pure Sn, annealed at 100° , showed fluctuations of the elec. resistance, with, first, sharp variations by 20-30% and returns to the normal value, and later a fall by 90-70% which, on very slow cooling, is resolved into a series of fluctuations. The resistance then goes back to normal for a last time, and from then on the amplitude of the fluctuations decreases progressively. There are a few sharp peaks at 0.003° below the beginning of the fluctuations. A similar picture is obtained on heating. With a magnetic field applied parallel to the axis of the wire, the curve is step-shaped, with level portions instead of peaks. Only at a sufficiently high magnetic field strength is there a sharp fall from the normal into the superconducting state, occurring within a temp. interval as narrow as 0.000003° . In a magnetic field perpendicular to the axis of the wire, the peaks and the steps disappear, and the whole curve becomes saw-shaped. Similar curves are found, without magnetic field, with wires strained by drawing, and with an unannealed wire of Ta. The observed discontinuities of the change of the elec. resistance are not due to fluctuations of the temp., nor to statistical fluctuations of the temp. Transition into the superconducting state begins with the formation of thread-shaped nuclei of the superconducting phase, oriented parallel to the current and thus causing a marked fall of the elec. resistance. On further lowering of the temp., these threads evidently coagulate, giving rise to a particular transition state. The step-shaped curve in a longitudinal magnetic field is apparently due to supercooling. In a transverse magnetic field, the saw-shaped form of the

curve results from a superposition of a no. of step transitions taking place in small vols. of the sample. From the rapid curves, in the absence of a magnetic field, the rate of growth of the nuclei of the superconducting phase can be read to a few mm./sec. II. A. A. Galkin, B. G. Lazarev, and P. A. Demuyt (Phys.-Tech. Inst., Acad. Sci. Ukr. S.S.R., Kiev). *Ibid.* 987-94; cf. C.A. 43, 4070k. The velocity v of the displacement of the boundary between the normal and the superconducting states was detd. in 2 independent ways. One method consisted in oscillography of the voltage E at the terminals of the secondary coil of a transformer with a superconducting core; the E induced in the coil depends both on the rate of change of the magnetic field H and on v . If the perturbation of the superconducting state begins at the periphery and r is a function of the radius r , then $E(t) = -(2\pi SIH/c)[v + (v/r)]$, where v = frequency, $r = dr/dt$, and S = cross-section area of the sample; v is thus obtained from the peak of the voltage obtained in the process of the perturbation. The detns. were made on samples of Hg and Sn 8-10 cm. long, 0.4-1.0 mm. in diam., enclosed in glass envelopes 0.05 mm. thick. Expts. showed that at the instant of the perturbation, $E(t)/E_0 = 1 + \{v(r)/v\} = k$, and in the normal state; hence, $E(t)/E_0 = 1 + \{v(r)/v\} = k$, and $v(r) > 2.5 \times 10^{-3} \times 10^4 \sim 10^5 \text{ cm./sec.}$ On the other hand, from the length of the impulse, on the assumption of complete disturbance in the transition process, $v = r/\Delta t = 5 \times 10^{-9}/2 \times 10^{-4} = 2 \times 10^4 \text{ cm./sec.}$ The depth of penetration δ of the disturbance of the supercond. is evidently smaller than the depth of penetration of the magnetic field into a metal in the normal state, owing probably to inhibition effects at the boundary between the 2 states. To est. δ , an a.c. of acoustic frequency was sent through a coil wound around a ring of Sn so as to create an adintl. magnetic field parallel to the current flowing along the surface of the ring. The max. induced current is $I_0 = H_0/2$, where H_0 = crit. magnetic field, r = radius of the superconducting cross-section of the sample; with the superconducting state disturbed to a depth δ , the current becomes $I = H_0(r - \delta)/2$, and hence I can be detd. from $I/I_0 = 1 - (\delta/r)$. The

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e.g. some amt. of free FeO or MnO, the presence of impurities favoring decompos. of FeCr_2O_4 to $\text{FeO} + \text{Cr}_2\text{O}_3$, or to formation of solid solns. of C in Fe. The latter factor can, at the limit, raise ΔH by $\sim 1270/T$, sufficient to account for the discrepancies. (3) For the 2nd step, $\text{Cr}_2\text{O}_3 + 3\text{C} = 2\text{Cr} + 3\text{CO}$, $\Delta H = \Delta H^\circ - 8.300 T - 1.164 \times 10^{-3} T^2 - 3.493 \times 10^4 T^{-1}$. By crit. analysis of available data, the heat of formation of Cr_2O_3 at 298°K. is taken as $-208,000 = 610 \text{ cal./mole}$. Hence, $\Delta H^\circ = 191,836$, and $\Delta F^\circ = 191,836 + 5.300 T \ln T + 1.164 \times 10^{-3} T^2 - 2.747 \times 10^4 T^{-1} - 109.53 T$, and $1/2 \log K_p \sim \log p_{\text{CO}} = -(13,977/T) - 0.9 \log T - 0.0848 \times 10^{-3} T + 0.2 \times 10^4 T^{-1} + 12.35$. The equil. pressure of CO should, consequently, be 1 atm. at 1550°K. Actually, under 1 atm., Cr_2O_3 is reduced at a lower temp., owing to formation of Cr carbides. (4) For the carbide formation $\text{Cr}_2\text{O}_3 (\text{solid}) + 1/2 \text{C} = 1/2 \text{Cr}_3\text{C}_2 (\text{solid}) + 3\text{CO} (\text{gas})$, $\Delta H = 176,070 - 0.868 T - 3.413 \times 10^{-3} T^2 - 3.87 \times 10^4 T^{-1}$, hence $\Delta F^\circ = 176,070 + 0.063 T \ln T + 3.413 \times 10^{-3} T^2 - 1.985 \times 10^4 T^{-1} - 139.42 T$, or $1/2 \log K_p \sim \log p_{\text{CO}} = (12,880/T) - 0.0907 \log T - 0.282 \times 10^{-3} T + 0.141 \times 10^4 T^{-1} + 10.1$. Exptl. detns., with pure Cr_2O_3 and pure graphite gave, at $T = 1193, 1223, 1253, 1303, 1323^\circ\text{K.}$, $p_{\text{CO}} = 0.029, 0.0664,$

0.0947, 0.2497, 0.3815 atm.; the product was identified as Cr_3C_2 by x-ray diffraction. The exptl. data lead to a correction of the last term of the ruled equation from 10.1 to 9.608. Equally applicable is the simpler empirical equation $\log p_{\text{CO}} = -(18,710/T) + 9.16$. (5) By the same procedure, there is found for the carbide formation: $\text{Cr}_2\text{O}_3 + 1/2 \text{Cr}_3\text{C}_2 = 1/2 \text{Cr}_7\text{C}_3 + 3\text{CO}$, $\log p_{\text{CO}} = (-14,825/T) - 3.87 \log T + 0.29 \times 10^{-3} T + 1.27 \times 10^4 T^{-1} + 21.68$; for $\text{Cr}_2\text{O}_3 + 1/2 \text{Cr}_7\text{C}_3 = 1/2 \text{Cr}_9\text{C}_4 + 3\text{CO}$, $\log p_{\text{CO}} = (-16,298/T) - 1.7 \log T + 0.018 \times 10^{-3} T + 0.173 \times 10^4 T^{-1} + 14.21$; and for $\text{Cr}_2\text{O}_3 + 3\text{Cr}_3\text{C}_2 = 14\text{Cr} + 3\text{CO}$, $\log p_{\text{CO}} = (-17,754/T) - 2.57 \log T + 0.42 \times 10^{-3} T + 0.238 \times 10^4 T^{-1} + 16.508$. The corresponding simplified two-term empirical equations for these 3 equilibria, obtained by graphic averaging, are, resp., $\log p_{\text{CO}} = (-13,226/T) + 8.818$; $(-16,454/T) + 8.22$; and $(-17,162/T) + 8.661$. (6) The reduction of Cr_2O_3 proceeds differently in the presence and in the absence of carbides. The highest p_{CO} corresponds to the carbide Cr_3C_2 , the lowest to Cr_7C_3 , with the p_{CO} for the reaction $\text{Cr}_2\text{O}_3 + 3\text{C} = 2\text{Cr} + 3\text{CO}$ lying in between. N. Thon

TA 169T101

USSR/Physics - Superconductivity Nov 50

"Certain Peculiarities of the Transition to the Superconducting State, II," A. A. Galkin, B. G. Lazarev, P. A. Bezuglyy, Physicotech Inst, Acad Sci Ukrainian SSR

"Zhur Eksper 1 Teoret Fiz" Vol XX, No. 11, pp 987-994

Uses independent methods to determine velocity of displacement of boundary between normal and superconducting states (v is about 1,000 cm/sec).

169T101

USSR/Physics - Superconductivity Nov 50
(Contd)

Shows this velocity differs when superconductivity is disrupted by constant and variable magnetic fields. Submitted 30 Mar 50.

169T101

GALKIN, A. A.

CA GALKIN, H-H.

4

Disturbance of superconductivity by an alternating current. A. A. Galkin and P. A. Bezuglyi (Acad. Sci. Ukr. S.S.R., Kiev). *Zhur. Ekspit. Teoret. Fiz.* 20, 1145 (1950). --With an a.c. of amplitude I_0 superimposed on a d.c. of intensity I_0 , if $I_0 + I_0 < I_c$ (crit. current intensity), the p.d. V on the sample is zero. With $I_0 > I_c - I_0$, V increases with I_0 , reaches a max., V_m , at $I_0 = I_c + I_0$, and then, as the neg. half-wave begins to take part in the disturbance of the supercond., V decreases with further increasing I_0 , tending to the limit V_m . At liquid He II temps., V_m decreases with increasing frequency ν . The contrary observations of Serin, Fehlniciér, and Garfunkel (*Phys. Rev.* 76, 167(1949)) at higher ν (more than 20,000 cycles per sec.) can be explained by improved thermal insulation at higher ν , and more nearly adiabatic transition. This point of view is corroborated by an expt. with 2 halves of a Sn rod, one half left in its glass envelope, the other half with the glass tube etched away. The latter shows V_m const. as a function of ν up to 20,000 cycles per sec., whereas with the former, that ratio is const. only up to $\nu = 2000$, then increases with further increasing ν up to $\nu = 10,000$; further increase of ν produces no further change in V_m . Evidently, from $\nu = 2000$ upwards, not all the heat absorbed or evolved in the superconductive transition is dissipated during a time distinctly shorter than the period of the a.c. At $\nu \sim 10^4$, the sample appears to be completely insulated. N. Thon

GALKIN, Aleksandr Aleksandrovich.

Academic degree of Doctor of Physico-Mathematical Sciences, based on his defense, 29 October 1954, in the Council of the Khar'kov State University imeni Gor'kiy, of his dissertation entitled: "Research on Superconductivity in Non-stationary Electromagnetic Waves."

Academic degree and/or title: Doctor of Sciences

SO: Decisions of VAK, List no. 12, 28 May 55, Byulleten' MVO SSSR, No. 15, Aug 56, Moscow, pp. 5-24, Uncl. JPFS/NY-537

GALKIN, A.A.

USSR

Absorption of an electromagnetic field by superconductors.
H. A. Galkin and P. A. Bezuglyi. *Doklady Akad. Nauk Ukr. R.S.R.* 1954, 178-81 (Russian summary, 182);
cf. *Doklady Akad. Nauk Ukr. R.S.R.* 1951, No. 6, 414.
The high-frequency resistance of Sn was measured on a single crystal over a frequency range 2.5×10^4 – 3.5×10^6 cycles/sec. London's 2-liquid model describes the relation between the surface resistance of the superconductor and the frequency or temp.
J. Rovnar Leach

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GALKIN, A.A.

USSR.

Problem of the existence of large dielectric constants in
superconductors. A. A. Galkin and M. I. Kaganov (Phys.
Tech. Inst. Acad. Sci. USSR, Kharkov). *Zhur.*
Eksp. i Teor. Fiz. 25, 701-3 (1954).--Theoretical. The
exptl. facts can be explained without recourse to a hypoth-
esis of large values of ϵ_0 or that the last portion of elec-
trons undergo transition in a bound state with energy kT_c .
No new anomalous effects need be expected in the frequency
region $\sim kT_c/h$.
P. H. Raftery.

GAIKIN, A. A.

Dissertation: "Study of Superconductivity in Nonstationary Electromagnetic Fields."
Cand Phys-Math Sci, Khar'kov State U, Khar'kov, 1954. (Referativnyy Zhurnal--Fizika,
Moscow, Aug 54)

SO: SUM 393, 28 Feb 1955

GALKIN, A. A.

USSR/Physics

Card 1/1

Authors : Galkin, A. A. and Bezuglyy, P. A.

Title : Frequency dependence of surface resistance isotherms of super-conductors

Periodical : Dokl. AN SSSR, 97, Ed. 2, 217 - 219, July 1954

Abstract : Experiments were conducted to determine the frequency dependance of surface resistances of super-conductors. An expression for R_s was derived and compared with experimental data. Nine references. R_n Graphs.

Institution : ...

Presented by : Academician I. K. Kikoin, March 23, 1954

GALKIN, A. A.

537.312.62

7975. The kinetics of destruction of superconductivity by a magnetic field. A. A. GALKIN AND P. A. BEZUGLYI. Zh. Eksp. Teor. Fiz., 29, No. 4, 463-70 (1955) In Russian.

USSR.

A superconducting tin or mercury cylinder was the core of a mutual inductance and the c.m.f. across the

62 (1)

secondary was studied oscillographically in the presence of various steady magnetic fields for various amplitudes of the primary alternating field (such that the total field was above critical for part of each cycle) and for various frequencies. From the results it is deduced in agreement with Lifshitz's theory (Abstr. 1016 (1952)) that the velocity of displacement of the boundary between superconducting and normal phases varies as ω/σ ($\sigma \rightarrow$ conductivity) but that the depth of destruction of superconductivity varies rather more rapidly with the excess of field over the critical than is predicted by the theory. It is estimated that the time of creation of a normal nucleus is $< 10^{-10}$ sec but the time of creation of a superconducting nucleus is $\sim 1.5 \times 10^{-10}$ sec.

D. SCHENBERG

Phys. Tech. Inst., USSR Acad. Sci.

GALKIN, A. A.

USSR/Atomic and Molecular Physics - Low Temperature Physics, D-5

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34440

Author: Galkin, A. A.

Institution: None

Title: On Critical Temperatures of Superconductors

Original Periodical: Uch. zapiski Khar'kovsk. un-ta, 1955, 64, 167-174

Abstract: To study the spectrum of quasiparticles in superconductors, it is interesting to search for the regions of anomalous absorption of high-frequency oscillations in the superconductor. For this purpose, the reflection from a grating made of Sn wires was studied at a frequency $\nu = 1.8 \times 10^{10}$ and the reflection from thin Sn films was studied at $\nu = 3.7 \times 10^{10}$ cycles. The reflection was determined from the standing-wave coefficient in a waveguide, inside which the investigated object was placed. Measurement with gratings has shown a change in reflection when superconductivity was annihilated by the magnetic field. The reflections from the films were used to compute approximately the electric conductivity of thin layers of Sn in normal state and the depth of penetration of the static field into the superconductor.

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GALKIN, A.A.; BEZUGLYY, P.A.

Calorimetric investigations on the absorption of high-frequency
fields by superconductors. Uch.zap. KHGU 64 no.6:175-182
'55. (MIRA 10:7)

(Superconductivity)

Galkin, A. A.

USSR/Atomic and Molecular Physics - Low Temperature Physics, D-5

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34441

Author: Galkin, A. A.

Institution: None

Title: Measurement of Surface Resistance of Superconducting Tin in the Microwave Region

Original Periodical: Uch. zapiski Khar'kovsk. un-ta, 1955, 64, 183-189

Abstract: A temperature curve was plotted for the active (R) and reactive (X) components of the surface resistance of chemically-pure ChDA-brand Sn at frequencies 3.5×10^{10} and 4.5×10^{10} cycles in the temperature range 2.2 - 4°K. The specimen was a small cylinder cast from Sn, the cavity and the internal surface of which were precisely cut on a lathe and mechanically polished and annealed. The temperature curve of R_s/R_n (R_s and R_n of the cavity in the superconducting and normal states) were determined by measuring the Q of the contour first in the superconducting state, then in the conducting state, at the specified temperature (after superimposing a constant magnetic field. The Q was estimated by sounding and comparing with the Q of a standard cavity. X_n (X of the metal in normal state) was calculated from the

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USSR/Atomic and Molecular Physics - Low Temperature Physics, D-5

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34441

Author: Galkin, A. A.

Institution: None

Title: Measurement of Surface Resistance of Superconducting Tin in the Microwave Region

Original Periodical: Uch. zapiski Khar'kovsk. un-ta, 1955, 64, 183-189

Abstract: relationship $X_n = \sqrt{3} R_n$, which is valid under conditions of the anomalous skin effect. X_s (X in the superconducting state) was found from the equation $X_s = X_n + \Delta X$, where ΔX is the change in X during the superconduction transition. X was measured from the shift in the natural frequency of the cavity. The temperature curves for R_s/R_n and $\Delta X/X_n$ are given for 4.5×10^{10} cycles and a conclusion is drawn that at 3.5×10^{10} and 4.5×10^{10} the effective dielectric constant remains negative for superconducting Sn. Summing up the results of the measurement of the dielectric constant of the superconductor at 4 frequencies (2.4×10^{10} , 2.75×10^{10} , 3.5×10^{10} , and 4.5×10^{10} cycles) the author thinks that the constant introduced into the theory of superconductivity in connection with the polarizability of the superconductor has so far not been justified experimentally.

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- 2 -

GALKIN, A. A.

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The tin surface resistance in the superconducting state at frequencies of 7.3×10^{10} hertz. P. A. Ezerskiy, A. A. Galkin, and G. Ya. Levin. *Doklady Akad. Nauk SSSR*, 1975, vol. 231, no. 4, p. 1311-1313. The temp. changes of R_s/R_n of Sn (where R_s and R_n are the Sn surface resistance in the superconducting and the normal region) show that at high electromagnetic field frequencies the differences between R_s and R_n should disappear, and that such critical frequency, found by extrapolation, is around 10¹¹ Mc. Measurements at such frequencies required some changes in the app., but measurements at 7.3×10^{10} Mc confirmed the conclusion, which can be explained by a rise in the effective penetration depth. W. M. Eschenberg.

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GALKIN, A. A. 21-5-3/26
 AUTHORS: Bezuglyy, P. A. (Bezuhlyy, P. A.) and Galkin, *A. A.* (Halkin, O. O.)
 TITLE: On the Absorption by Superconducting Tin of Electromagnetic Radiation of Frequencies 8.3×10^{10} and 11.1×10^{10} cycles (0 pogloshchenii sverkhprovodyashchim olovom elektromagnitnogo izlucheniya chastoty 8.3×10^{10} i 11.1×10^{10} gerts)
 PERIODICAL: Dopovidi Akademii Nauk Ukrain's'koi RSR, 1957, Nr 5, pp. 436-438 (USSR)
 ABSTRACT: The temperature-dependence of the ratio $\frac{R_s(T)}{R_n}$ (where R_s is surface resistance in the superconducting state and R_n is surface resistance in the normal state) in a tin sample was studied at frequencies of 8.3×10^{10} and 11.1×10^{10} cps. The range of temperatures employed was from 1.5° to 4°K . The sample was a tin single crystal polished by the electrolytic method. Its purity was 99.999%. The results of measurements are shown in the figure of the article where the values of the ratio are represented by ordinates and absolute temperatures by abscissae. These data show that at the frequencies used, the difference between R_s and R_n is preserved, decreasing with the rise of frequency. Inasmuch as surface resistance does not approach zero at temperatures approximating

Card 1/2

21-5-3/26

On the Absorption by Superconducting Tin of Electromagnetic Radiation of Frequencies 8.3×10^{10} and 11.1×10^{10} cycles

absolute zero, the authors conclude that this indicates the quantum absorption of electromagnetic radiation by superconducting electrons. There is one figure and 7 references, 5 of which are Slavic.

ASSOCIATION: Physico-Technical Institute of the AN Ukrainian SSR

PRESENTED: By B.G. Lazarev (B.H. Lazarev), Academician of the AN Ukrainian SSR

SUBMITTED: 2 February 1957

AVAILABLE: Library of Congress

Card 2/2

AUTHOR: GALKIN, A.A., SHAMFAROV, YA.L., STEFANISHINA, A.V. 56-646/56
TITLE: Electron Resonance on the Occasion of the Passage of Current
through Liquids. (Elektronnyy rezonans v rastvorakh pri prokhozhenii toka, Russian)
PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 6, pp 1581-1584
(U.S.S.R.)
ABSTRACT: If NaCl which was dissolved in ammonia is exposed to the high frequency field of a radiospectrometer and if then a current is made to pass through the solution, a resonance line forms which corresponds to the Na-line in liquid NH₃. The intensity of the line depends on the amperage. If the solution is cooled in liquid nitrogen during the passage of the current, the color of the liquid is conserved also after the current is switched off. A recombination of the electrons with chlorine does not take place. By this method it should be easy to determine the nature of a number of liquids.
(With 2 Illustrations and 1 Slavic Reference).
ASSOCIATION: Radiophysical and Electronic Institute of the Academy of Science of the U.S.S.R.
PRESENTED BY:
SUBMITTED: 23.3.1957
AVAILABLE: Library of Congress
Card 1/1

GALKIN, A.A.

56-6-47/56

AUTHOR:
TITLE:

GALKIN, A.A., KAN, Ya.S., LAZAREV, B.G.
On the Jump-Like Damping of the Current in a Supraconductive
Ring. (O skachkoobraznom zatukhanii toka v sverkhprovodyashchem
kol'tse, Russian)

PERIODICAL:

Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 6,
pp 1582 - 1582 (U.S.S.R.)

ABSTRACT:

A thin lead ring located coaxially with a coil is cooled down
to the temperature of liquid helium, and in it a current is
induced. If the lead ring is evenly heated (10^{-4} to 10^{-50} /sec)
an EMF will be generated in the coil. On this occasion it will be
noticed that the current dies down abruptly. These current jumps
have aduration of some seconds. In the intervals between jumps
the current remains equal. At $4,2^{\circ}\text{K}$, $\Delta I/I \sim 10^{-4}$. The effective
resistance which corresponds to the damping of the current at the
places where the jumps occur, amounts to $\sim 10^{-11}\Omega$. (1 illustrationn
and 2 Slavic references)

ASSOCIATION:

Physical-Technical Institute of the Ukrainian Academy of Science.
(Fisiko-tekhnicheskii institut Akademii nauk U.S.S.R.)

PRESENTED BY:

SUBMITTED:

13.3.1957

AVAILABLE:

Library of Congress

Card 1/1

Galkin, A. A.

56-4-3

AUTHORS: Bezug'lyy, P. A., Galkin, A. A.,

TITLE: **The Cyclotron Resonance in Tin at a Frequency of 9300 mc** (Letter to the Editor) (Tsiklotronnyy resonans v olove pri chastote 9300 mg.s.)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol. 33, Nr 4, p. 1078, (USSR)

ABSTRACT: In a magnetic field that runs exactly parallel to the surface of a metal sample it is possible that a cyclotron resonance occurs. In order to prove the existence of the latter the dependence of the active portion of the surface resistance of a tin sample on the field intensity of a constant magnetic field at 9300 Mhz was experimentally taken. The tin sample consisted of a 0,8 mm thick, electropolished, monocrystalline wire in which the fourth order axis coincided with an accuracy up to 5° with the axis of the wire. The sample was placed in a coaxial copper resonator. The measurements were made at 4,2°K and 2°K. From the resulting curves it may be seen that a monotonous decline of the resistance is to be observed in fields larger than 4000 Oe. At $H_1 = 3600$ and $H_2 = 900$ Oe, 2 resonance minima were noticed. At the lower temperature the minima emerge more clearly. At the same time, however, they lift somewhat toward the side of the field intensity. A rotation of the sample by 90° opposite the constant magnetic field furnishes almost the same results. These data are in good agreement with other experimental results. There are 4 Slavic references.

Card 1/2

. The Cyclotron Resonance in Tin at a Frequency of 9300 mc (Letter
to the Editor)

56-4-54/54

ASSOCIATION: Physico-Technical Institute AN Ukrainian SSR (Fiziko-technicheskiy
institut Akademii nauk Ukrainskoy SSR)

SUBMITTED: July 29, 1957

AVAILABLE: Library of Congress

Card 2/2

Parameter	Estimate	Standard Error	z	P	95% CI
Intercept	1.00	0.00			
Age	0.01	0.01	0.10	0.92	-0.01, 0.03
Gender	0.01	0.01	0.10	0.92	-0.01, 0.03
Education	0.01	0.01	0.10	0.92	-0.01, 0.03
Income	0.01	0.01	0.10	0.92	-0.01, 0.03
Health	0.01	0.01	0.10	0.92	-0.01, 0.03
Marital	0.01	0.01	0.10	0.92	-0.01, 0.03
Religious	0.01	0.01	0.10	0.92	-0.01, 0.03
Political	0.01	0.01	0.10	0.92	-0.01, 0.03
Occupational	0.01	0.01	0.10	0.92	-0.01, 0.03
Residential	0.01	0.01	0.10	0.92	-0.01, 0.03
Environmental	0.01	0.01	0.10	0.92	-0.01, 0.03
Social	0.01	0.01	0.10	0.92	-0.01, 0.03
Cultural	0.01	0.01	0.10	0.92	-0.01, 0.03
Economic	0.01	0.01	0.10	0.92	-0.01, 0.03
Technological	0.01	0.01	0.10	0.92	-0.01, 0.03
Political	0.01	0.01	0.10	0.92	-0.01, 0.03
Religious	0.01	0.01	0.10	0.92	-0.01, 0.03
Cultural	0.01	0.01	0.10	0.92	-0.01, 0.03
Economic	0.01	0.01	0.10	0.92	-0.01, 0.03
Technological	0.01	0.01	0.10	0.92	-0.01, 0.03
Political	0.01	0.01	0.10	0.92	-0.01, 0.03
Religious	0.01	0.01	0.10	0.92	-0.01, 0.03
Cultural	0.01	0.01	0.10	0.92	-0.01, 0.03
Economic	0.01	0.01	0.10	0.92	-0.01, 0.03
Technological	0.01	0.01	0.10	0.92	-0.01, 0.03
Political	0.01	0.01	0.10	0.92	-0.01, 0.03
Religious	0.01	0.01	0.10	0.92	-0.01, 0.03
Cultural	0.01	0.01	0.10	0.92	-0.01, 0.03
Economic	0.01	0.01	0.10	0.92	-0.01, 0.03
Technological	0.01	0.01	0.10	0.92	-0.01, 0.03
Political	0.01	0.01	0.10	0.92	-0.01, 0.03
Religious	0.01	0.01	0.10	0.92	-0.01, 0.03
Cultural	0.01	0.01	0.10	0.92	-0.01, 0.03
Economic	0.01	0.01	0.10	0.92	-0.01, 0.03
Technological	0.01	0.01	0.10	0.92	-0.01, 0.03
Political	0.01	0.01	0.10	0.92	-0.01, 0.03
Religious	0.01	0.01	0.10	0.92	-0.01, 0.03
Cultural	0.01	0.01	0.10	0.92	-0.01, 0.03
Economic	0.01	0.01	0.10	0.92	-0.01, 0.03
Technological	0.01	0.01	0.10	0.92	-0.01, 0.03
Political	0.01	0.01	0.10	0.92	-0.01, 0.03
Religious	0.01	0.01	0.10	0.92	-0.01, 0.03
Cultural	0.01	0.01	0.10	0.92	-0.01, 0.03
Economic	0.01	0.01	0.10	0.92	-0.01, 0.03
Technological	0.01	0.01	0.10	0.92	-0.01, 0.03
Political	0.01	0.01	0.10	0.92	-0.01, 0.03
Religious	0.01	0.01	0.10	0.92	-0.01, 0.03
Cultural	0.01	0.01	0.10	0.92	-0.01, 0.03
Economic	0.01	0.01	0.10	0.92	-0.01, 0.03
Technological	0.01	0.01	0.10	0.92	-0.01, 0.03
Political	0.01	0.01	0.10	0.92	-0.01, 0.03
Religious	0.01	0.01	0.10	0.92	-0.01, 0.03
Cultural	0.01	0.01	0.10	0.92	-0.01, 0.03
Economic	0.01	0.01	0.10	0.92	-0.01, 0.03
Technological	0.01	0.01	0.10	0.92	-0.01, 0.03
Political	0.01	0.01	0.10	0.92	-0.01, 0.03
Religious	0.01	0.01	0.1		

NOV-120-56-3-16/33

AUTHORS: Galkin, A. A., Kichigin, D. A.

TITLE: A Device for Electron Resonance Studies over a Wide Temperature Range (Pribor dlya izucheniya elektronogo rezonansa v shirokoy oblasti temperatur)

PERIODICAL: Priroda i Tekhnika Eksperimenta, 1958, Nr 3, pp 71-72 (USSR)

ABSTRACT: Zavoyskiy's original simple grid-current method of studying EPR resonance is modified by inserting a semiconductor between the plates of the condenser in the oscillatory circuit. The semiconductor has to be one which is of good light sensitivity; then the loss component introduced by the semiconductor can be evaluated by illuminating it with a chopped light beam of known strength. A method is thereby provided of standardizing the oscillatory circuit if the EPR line varies in any way with temperature, since the semiconductor can be kept on strictly standardized conditions. The coaxial line to the coil round the specimen is constructed of German silver (to minimize heat transfer). The

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SOV-120-55-3-15/53

.A Device for Electron Resonance Studies over a Wide Temperature Range

semiconductor (Cu_2O) is illuminated via holes in one of the plates of the capacitor. The article contains 1 figure and 2 references, both (Soviet) to Zavoyskiy's original studies.

ASSOCIATION: Institut radiofiziki i elektroniki AN USSR
(Institute of Radiophysics and Electronics, Academy of Sciences, Ukrainian SSR)

SUBMITTED: September 9, 1957.

1. Electrons--Resonance
2. Resonance---Temperature factors
3. Semiconductors--Applications

Card 2/2

SOV/126-6-4-33/34

AUTHORS: Galkin, A. A. and Kichigin, D. A.

TITLE: Influence of Plastic Deformation on the Width of the
Electron Resonance Line (Vliyaniye plasticheskoy
deformatsii na shirinu linii elektronnoho rezonansa)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 4,
p 767-768 (USSR)

ABSTRACT: A number of papers (Refs 1-6) are devoted to investigating
electron resonance in metals. In these, the dependence
of the width of the line on the temperature, the
quantity of admixtures and the particle size have been
investigated in detail. In this paper experiments are
described on elucidating the influence of plastic
deformation on the resonance effects. It is known that
in the case of plastic deformation residual micro-
stresses accumulate in a crystal which lead to an excess
of potential energy (Ref 7). However, if investigation
of the plastic deformation is effected at room tempera-
ture, it has relatively little influence on the electric
conductivity and the Hall effect of the metals. The
width of the electron resonance line for lithium is

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Influence of Plastic Deformation on the Width of the Electron Resonance Line

sensitive to admixtures (Ref 6). Therefore, the influence of plastic deformation on the electron resonance was investigated for lithium, specimens of which were plastically deformed by rolling on glass at room temperature. The specimens were rolled down to a thickness of 0.1 to 0.05 mm. After rolling, the foil was coiled and placed into a glass ampule filled with dehumidified oil. The ampule with the specimen was placed into the coil of an oscillator circuit operating at 350 Mc/sec. The indication of electron resonance was by means of the method of Zavoytskiy (Ref 8). The width of the electron resonance line after plastic deformation was 20 Oe. Thus, plastic deformation of lithium at room temperature led to an increase to double of the width of the line. After "annealing" of the foil, effected at room temperature, the width of the line contracts reaching 10 Oe. after 40 to 60 hours. For elucidating the kinetics of removing the stresses in lithium, a series of measurements were carried out of the dependence of the width of the line on the time for the

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Influence of Plastic Deformation on the Width of the Electron
Resonance Line

annealing temperature 293 and 373°K. For this purpose, after rolling at 293°K the foil was cut into two halves and the obtained specimens were annealed at 293 and 375°K. The graph, Fig 1, shows the dependence of the width of the line on the time for the two specimens; as was to be expected annealing at 100°C is considerably faster than at 20°C. From the temperature curves $\Delta E(t)$ the activation energy was calculated which was found to equal about 1500 cal/mol. A similarly small activation energy during plastic deformation was also observed by Khotkevich (Ref 7). It is possible that the dependence of the width of the line on the dimensions of the particles observed by Garif'yanov (Ref 5) can be explained by the fact that in finer particles the residual deformations, caused during the breaking up, are

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removed almost instantaneously, whilst the removal of the deformations in larger particles is a considerably slower process. In Fig.1 the dependence is graphed of the width of the resonance curve (O_e) on the annealing time (hours). The top curve relates to annealing at room temperature, the bottom curve relates to annealing at 600°C .

There are 1 figure and 8 references, 3 of which are Soviet, 5 English.

(Note: This is a complete translation)

ASSOCIATION: Khar'kovskiy pedagogicheskiy institut (Khar'kov Pedagogic Institute)

SUBMITTED: April 8, 1957

Card 4/4

AUTHORS: Galkin, A. A. and Kichigin, D. A. *SOV/65-58-7-2/12*

TITLE: Investigations on the Paramagnetic Resonance in Coal From the Donets Basin. (Issledovaniye paramagnitnogo rezonansa v kamennykh uglyakh Donetskogo basseyna).

PERIODICAL: Khimiya i Tekhnologiya Toplivo i Masel, 1958, Nr.7. pp. 8 - 14. (USSR).

ABSTRACT: Investigations on the structure of substances can be carried out by defining the paramagnetic resonance. It was aimed to find the connection between the geological growth of coal and the intensity and width of the paramagnetic resonance (PR) line. The present studies concerned the PR in the component structure of coal which helped during investigations on the PR in coals of various petrographic composition. Apart from this, the PR curves can be used for defining some physico-chemical constants. The method of Ye. K. Zavoyskiy (Ref.9) was used. Setting up of the apparatus: Fig.1; samples of coal from the Donets Basin, differing in their geological growth and technical and petrographic composition, were tested. The intensity of the PR line is maximal in anthracite and minimal in slow-burning coal. This agrees with the findings of S. Uebersfeld et al (Ref.3). Fig.2: a diagram on the dependence of the intensity of the PR line on the

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SOV/55-59-7-2/12

Investigations on the Paramagnetic Resonance in Coal From the Donets Basin.

geological growth of coal samples. Tests were carried out on fusite (mineral charcoal), vitrain gas coal (a variety of bituminous coal), and also on some samples of fusite slow-burning coal and coke. It was concluded that a relationship exists between the intensity of the PR line and the degree of metamorphosis of the coal, and that the former increases with increasing geological growth of coal (Fig.3). The width of the PR line of various types of anthracite ranges from 0.5 to 3.5 oersteds, and for other coals it ranges from 6 - 7 oersteds. The structural components of coal affect the width and the intensity of the PR line. The PR line of fusite of coke, gaseous, and slow-burning coal is identical within the limits of experimental error. The static spin susceptibility of coal was calculated by comparing the intensity of the electronic and nuclear resonances, and from this the order of magnitude of the concentration of electrons in one gram of coal determined. There are 2 Tables, 3 Figures and 12 References: 5 Soviet, 4 English and 3 French.

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SOV/65-58-7-2/12

Investigations on the Paramagnetic Resonance in Coal From the Don Basin.

ASSOCIATION: Kharkovskiy pedagogicheskiy institut. (Kharkov Teachers' Institute).
Institut radiofiziki i elektroniki AN USSR (Institute of Radiophysics & Electronics of the USSR Academy of Sciences)

1. Coal--Structural analysis
2. Coal--Magnetic factors

Card 3/3

Galkin A A

AUTHORS: Bezuglyy, P. A., Galkin, A. A. 56-1-40/56

TITLE: The Cyclotron Resonance in Lead at a Frequency of 8900 Megacycles. (Tsiklotronnyy rezonans v svintse pri chastote 8900 megts)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 1, pp. 236-237 (USSR)

ABSTRACT: The present paper shortly reports on the results of the experiments made on the observation of the cyclotron-resonance of lead at 8900 megacycles. At first the reasons for the selection of lead as test-object are given. A mono-crystalline lead wire, ~ 12 mm in length and ~0,8 mm in diameter, served as sample. A coaxial copper resonator was fastened along the axis. The surface resistance of the sample was investigated by the same method as employed by the same authors in the investigations of the cyclotron-resonance in tin (reference 3). The results of the measurements of $R(H)/R(1300)$ in lead at the frequency of 8900 megacycles at the temperatures 4,2°K and 2°K are given in a diagram. $R(H)$ signifies the surface resistance in a constant field with more than 1300 oersted field strength.

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The Cyclotron Resonance in Lead at a Frequency of 8900
Megacycles

56-1-40/56

This diagram clearly shows the important influence exerted by the relaxation time of the electrons upon this phenomenon. At $4,2^{\circ}\text{K}$ only a monotonous decrease in the resistance with increasing field strength is observed, but at 2°K and $H \sim 2400$ oersted a fairly low resonance-minimum exists. After this minimum follows a maximum and then the surface resistance rapidly decreases in agreement with the forecast of theory. In lead (just as in tin) the main groups of the electrons supposedly are responsible for the cyclotron resonance. There are 1 figure and 6 references, 4 of which are Slavic.

ASSOCIATION: Physical-Technical Institute AN Ukrainian SSR
(Fiziko-tehnicheskii institut Akademii nauk Ukrainsskoy SSR)

SUBMITTED: October 5, 1957

AVAILABLE: Library of Congress

Card 2/2

6.44/10
AUTHORS: Bezuglyy, P. A., Galkin, A. A. 56-1-41/56

TITLE: An Investigation of the Surface Resistance of Tin in Weak Magnetic Fields (Issledovaniye poverkhnostnogo soprotivleniya olova v slabykh magnitnykh polyakh)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 1, pp. 237-238 (USSR)

ABSTRACT: The authors investigated this surface resistance at field strengths up to 100 oersted with a method already described earlier (reference 3). The results of these experiments at a frequency of 9300 mega-cycles and a temperature of 4.2°K are here illustrated in a diagram. In agreement with the forecast of theory the active resistance of the metal at field strengths up to 10 oersted is practically independent on the field strength, i. e. at $H \rightarrow 0$ applies $dR/dH \rightarrow 0$. When $H > 10$ oersted the surface resistance monotonously decreases with increasing field strength. In measurements of the temperature dependence of R_s/R_n in semiconductors it has to be reckoned with the dependence of the surface resistance of metals on the strength of the magnetic field. In this connection R_s and R_n signify the surface resistances

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r An Investigation of the Surface Resistance of Tin in Weak
Magnetic Fields

56-1-41/56

of the metal in the superconducting and in the normal state
respectively. A disregarding of this fact would lead to
increased values of R_s/R_n . There are 1 figure and 3
references, all of which are Slavic.

ASSOCIATION: Physical-Technical Institute AN Ukrainian SSR (Fiziko-
-tekhnicheskii institut Akademii naukUSSR)

SUBMITTED: October 5, 1957

AVAILABLE: Library of Congress

Card 2/2

AUTHORS: Galkin, A. A.; Korolyuk, A. P. 56-34-4-49/60

TITLE: The Dispersion of Sound Velocity in Metals in a Magnetic Field
(Dispersiya skorosti zvuka v metallakh v magnitnom pole)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,
Vol. 34, Nr 4, pp. 1025 .. 1026 (USSR)

ABSTRACT: The dispersion of sound velocity in hard metals predicted by R. A. Alpher and R. I. Rubin (Ref 1) has hitherto not been observed, apparently because of the smallness of the effect. The present report describes experiments connected with the discovery of this phenomenon. An apparatus was developed and built for the investigation of slight variations of the sound vibrations which, in the case of favorable conditions, makes it possible to measure relative deviations of about 10^{-6} from sound velocity. The principle of the measurements is based on the comparison and the measuring of the phase difference of the vibrations passing through the sample to be investigated. The block scheme of the measuring apparatus is shown by a diagram. The high frequency voltage originating from a generator (stabilized by means of quartz)

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The Dispersion of Sound Velocity in Metals in a Magnetic Field 56-34-4-49/60

is transferred to the radiating quartz which on one side was stuck on to the cylindrical sample. The receiving quartz is then stuck on to the second front face of the sample, and the voltage produced by it is then transferred to a phase-meter. At the same time a voltage is directly transferred to the phasemeter from the radiating crystal. For the investigation of the ultrasonic vibrations quartz plates (x-section) of a diameter of 10 mm were used. Cylindrical rods of a length of 20 cm and a thickness of 1.4 cm served as samples. A diagram shows the results of these experiments, which were carried out at room temperature in a field vertical to the axis of the sample. The experimental points fit well on the theoretically calculated straight lines. Sound velocity thus increases proportionally to H^2 in the magnetic field and the intensity of the effect corresponds to the predictions of theory. It is interesting to learn that in bismuth no dispersion of the sound velocity was observed at room temperature. Finally, the authors thanked Professor A. I. Akhiezer and S. V. Peletminskiy, who had directed their attention to the discussed phenomenon. There are 2 figures and 2 references, 1 of which is Soviet.

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The Dispersion of Sound Velocity in Metals in a Magnetic Field 56-34-4-49/60
ASSOCIATION: Institut radiofiziki i elektroniki Akademi nauk Ukrainskoy
SSR
(Institute of Radiophysics and Electronics AS Ukrainian SSR)
SUBMITTED: January 14, 1958

1. Sound--Refraction
2. Metals--Acoustic properties

Card 3/3

24(1), 24(3)

AUTHORS: Galkin, A. A., Korolyuk, A. P.

SOV/56-36-4-52/70

TITLE: Anisotropy of the Absorption of Ultrasonics in Metals in the Magnetic Field (Anizotropiya pogloshcheniya ul'trazvuka v metallakh v magnitnom pole)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 4, pp 1307-1309 (USSR)

ABSTRACT: It has already been shown that for longitudinal sound the absorption coefficient in tin depends on the magnetic field - in such a manner, that if the latter is vertical to the wave vector, a weakly marked maximum of absorption occurs in certain fields; a similar phenomenon is observed in polycrystalline copper and in indium. In the present "Letter to the Editor" experiments are discussed in which the influence exercised by the magnetic field on the absorption of ultrasonics at low temperatures in polycrystalline samples of very pure metals was investigated. Tin with a residual resistance $\rho_{4.2} = 1.6 \cdot 10^{-5}$ and zinc with $R_{4.2}/R_{300} = 2 \cdot 10^{-4}$ was investigated. The samples had a diameter of 12 and a length of 12 and 15 mm respectively. The absorption coefficients were determined by

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Anisotropy of the Absorption of Ultrasonics in
Metals in the Magnetic Field

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means of the well-known pulse method at frequencies of 17.3, 23.3, 51, and 70 megacycles. Figure 1 shows the results obtained by measurements carried out at 4.2° K with a magnetic field that was vertical to the wave vector. The curves plotted at higher frequencies show already two maxima. Thus, zinc at 70 megacycles showed a minimum at about 500 Oe, the first maximum at about 800, and a second flat maximum at about 2,000 Oe. If the magnetic field rotates in a plane that is vertical to the sample axis, the curves are found to vary essentially: The absorption of the maxima and their amount varies, in the case of certain directions these maxima vanish, and in certain cases the maxima exist only within range of the angles of 15-20°. Figures 2 and 3 show such diagrams at 70 megacycles. Here the absorption coefficient for ultrasonics shows a tendency of assuming a saturation value at 5,000-6,000 Oe. This limiting value depends on the orientation of the sample in the field. The diagrams for the limiting value in the case of strong fields describe the anisotropy of electric conductivity in the magnetic field. There are 3 figures and 6 references, 1 of which is Soviet.

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Anisotropy of the Absorption of Ultrasonics in
Metals in the Magnetic Field

SOV/56-36-3-52/70

ASSOCIATION: Institut radiofiziki i elektroniki Akademii nauk Ukrainskoy
SSR (Institute for Radiophysics and Electronics of the Academy
of Sciences, Ukrainskaya SSR). Fiziko-tekhnicheskiy institut
Akademii nauk Ukrainskoy SSR (Physico-technical Institute of
the Academy of Sciences, Ukrainskaya SSR)

SUBMITTED: December 12, 1958

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24 (1)

AUTHORS: Bezuglyy, P. A., Galkin, A. A.
Korolyuk, A. P.

SOV/56-36-6-61/66

TITLE: The Anisotropy of the Absorption Coefficients of Ultrasonics
in Superconductors (Anizotropiya koeffitsiyentov pogloshcheniya
ul'trazvuka v sverkhprovodnikakh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959
Vol 36, Nr 6, pp 1951 - 1952 (USSR)

ABSTRACT: By the investigation of the absorption of ultrasonics in superconductors it is possible to determine the size of the energy slit at $T = 0$ as well as the dependence of the slit width (ξ_0) on temperature. The experiments carried out in this connection are in agreement with theory. By means of experiments also the influence exercised by the isotope composition and the homogeneous lattice deformation upon T_k and on the width of the slit was investigated. It may be imagined that lattice anisotropy leads to more visible results than isotopic composition. In the present "Letter to the Editor" experimental results concerning the absorption of ultrasonics (frequency 70 kilocycles) in superconductive and normal media are published. (Determina-

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The Anisotropy of the Absorption Coefficients of
Ultrasonics in Superconductors

SOV/56-36-6-61/66

tion of the absorption coefficient in the C_2 - and C_4 -axis of a spherical tin sample). The results, which were dealt with by the method developed by Bardeen, Cooper and Schrieffer (Ref 4) are shown in a table. It was found that the temperature dependence of the ratio of the absorption coefficient α_s/α_n is different in the two directions. The case of sound propagation along the C_4 -axis agrees better with the isotropic theory of superconductivity. There are 1 table and 4 references, 1 of which is Soviet.

ASSOCIATION: Fiziko-tekhnicheskii institut Akademii nauk Ukrainskoy SSR
(Physico-technical Institute of the Academy of Sciences,
Ukrainskaya SSR)

SUBMITTED: April 7, 1959

Card 2/2

24 (1)

AUTHORS: Galkin, A. A., Korolyuk, A. P.

SOV/56-37-1-53/64

TITLE: Oscillation of the Sound Absorption Coefficient in Lead at Low Temperatures (Ostsillyatsii koeffitsiyenta pogloshcheniya zvuka v olove pri nizkikh temperaturakh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 1, pp 310 - 312 (USSR)

ABSTRACT: It has already been shown (Refs 1-3) that the absorption coefficient of ultrasonics in metal does not change monotonely with the magnetic field, but that it has a special anisotropy. The authors of the present "Letter to the Editor" investigate the latter at an ultrasonic frequency of 70 megacycles and give a report on the results obtained. Investigations were carried out in a spherical monocrystalline lead sample of 15 mm diameter. Planes were cut off from the sphere, to which the ultrasonic sources were applied. The perpendicular lines of these planes were parallel to the axes of 2. and 4. order. Absorption was investigated for longitudinal sound, the wave vector \vec{k} of which was parallel to the axis of 2. or 4. order. The sample was rotated in the magnetic field \vec{H} , with the \vec{k} -vector remaining per-

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Oscillation of the Sound Absorption Coefficient in Lead at Low Temperatures SOV/56-37-1-53/64

pendicular to \vec{H} . Figure 1 shows the course of the amplitude in dependence on the field strength (45 - 1000 Oe) at $T = 4.2^\circ\text{K}$, for sound propagation along the axis of second order; \vec{H} was parallel to the axis of 4. order. The curve has a manifold of marked maxima and minima (of V. Gurevich, Ref 4). From the oscillation periods the magnitude of the limiting momentum of the electron was estimated at $p = 5 \cdot 10^{-20} \text{ g.cm/sec}$. Figure 2 shows the dependence of the projection of the limiting momentum of the electrons on to the plane (001) as a function of the angle between the axes of 2. and 4. order, developed according to oscillation periods. Figure 3 shows several results of measurements of the absorption coefficient in dependence on the magnetic field voltage and the angle of rotation φ in the (001)-plane. Figure 4 shows the angular dependence of the absorption coefficient at $H = 7 \cdot 10^3 \text{ Oe}$ and with rotation of the field in the (001)-plane. The investigation of sound absorption in a field $\vec{H} \parallel \vec{k}$ shows that the curve $\alpha(H)$ has singular points. According to the theory by V. Gurevich, the magnetic field in

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Oscillation of the Sound Absorption Coefficient in SOV/56-37-1-53/64
Lead at Low Temperatures

these points satisfies the condition $H_1 = \text{const}/n$, where n is an integer number. There are 4 figures and 4 references, 2 of which are Soviet.

ASSOCIATION: Institut radiofiziki i elektroniki Akademii nauk Ukrainskoy SSR
(Institute of Radiophysics and Electronics of the Academy of Sciences, Ukrainskaya SSR)

SUBMITTED: March 25, 1959

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